

## EXPLORATIONS IN THE HIMALAYAS.

THE paper read by Mrs. Bullock Workman before the Royal Geographical Society in November last is published in the February number of the *Geographical Journal*. An account is given of the exploring work carried out by Dr. and Mrs. Bullock Workman during 1903 in the region of the Karakoram mountains lying south-west of the Hispar glacier, or between that glacier and the Indus. This region is cut off from the Hispar glacier by a practically continuous ridge, and is crossed by glaciers moving from north and north-west, the chief being the Chogo Lungma, Alchori, Hoh Lumba, and Sosbon glaciers. The work of the expedition consisted chiefly in the examination of the Hoh Lumba and Sosbon glaciers, and in ascents of Mounts Chogo (21,500 feet) and Lungma (22,568 feet), near the head of the Chogo Lungma glacier.

The narrow Hoh ravine runs northward from the junction with the Braldo River, and is ascended along the



FIG. 1.—Nangma Tapsa and the huge terminal moraine of the Hoh Lumba, forming a large hill about 500 feet high; its age is indicated by the tree growth covering its surface.

precipitous cliffs of nude mountains. It is filled by old glacial débris several hundreds of feet deep, the river cutting its way often at a great depth. Some four miles up is Pirnar Tapsa, a small grazing ground, and two miles beyond is Nangma Tapsa, a similar spot at an elevation of 11,595 feet. Immediately above this is a huge terminal moraine, of which we are able to reproduce a photograph. The snout of the glacier is about a mile further up, and the total length from the snout to the source on the "col des Aiguilles" is twelve miles. The expedition found much evidence that the glacier has retreated somewhat rapidly of late years.

## OSMOSIS AND OSMOTIC PRESSURE.

NO problem is of greater importance in modern physical chemistry than the determination of the true nature of osmosis and of osmotic pressure. Although for some considerable period this problem has to most chemists appeared solved, several recent investigations have thrown doubt upon the validity of van 't Hoff's hypothesis that the osmotic pressure developed in solutions is purely a kinetic phenomenon. The experiments of Battelli and Stephanini in this connection have already been referred to in NATURE (vol. lxxii., p. 541). Some remarkable results which have

been obtained by Prof. Louis Kahlenberg are now described in the Transactions of the Wisconsin Academy (March) and the *Journal of Physical Chemistry* (vol. x., pp. 141-209); these, if subsequently verified, will invalidate van 't Hoff's theory, and, what is of even greater importance, destroy the basis of the theory of electrolytic dissociation, developed by Arrhenius, upon which modern physical chemistry so largely depends.

Prof. Kahlenberg's experiments would indicate that the osmotic pressure developed in the case of any solution depends essentially on the nature of the membrane used, even when this is practically semi-permeable, as well as on the nature and concentration of the solution. Strictly speaking, there is no definite osmotic pressure characterising a solution of given concentration at a definite temperature; the pressure depends on the septum employed. It is recalled to mind that van 't Hoff's conception really rests on the measurements of osmotic pressure made by Pfeffer, that these measurements were few in number and were obtained with one membrane only, and that several recent direct measurements of osmotic pressures have given values not in accord with the gas laws. It is stated that in order to obtain a definite value for the osmotic pressure it is absolutely necessary that the solution within the osmometer should be well stirred, a precaution that has hitherto been omitted in all measurements. The measurements obtained by the author, observing this precaution, did not agree in any case with the gas laws.

The magnitude as well as the direction of the osmotic pressure are, according to Prof. Kahlenberg, determined by the power of the membrane to "imbibe" the solvent and solute, and by the mutual solubilities of the substances dealt with. Cases of abnormal dialysis are adduced in support of this theory. Thus a colloid, copper oleate, dissolved in pyridine, will diffuse through a rubber membrane, whilst a crystalloid, cane sugar, remains behind. Again, when a solution of camphor and cane sugar in pyridine is subjected to dialysis through the same membrane, the camphor diffuses through it, and the cane sugar is again left behind. In this case two crystalloids are separated completely by dialysis. Such facts are not reconcilable with the ordinary views of diffusion. Some suggestive remarks by the late Prof. Raoult, contained in a letter to Prof. Bancroft, in criticism of van 't Hoff's theory are now published for the first time.

MARINE BIOLOGY ON THE WEST COAST.<sup>1</sup>

THE report for 1905 on the Lancashire Sea Fisheries Laboratory at the University of Liverpool and the Sea Fish Hatchery at Piel is a somewhat thicker volume than was the report for 1904, and contains some interesting papers.

Besides the introduction and general account of the work by Prof. Herdman, and a report upon the classes, visitors, &c., at Piel by Mr. Andrew Scott, it contains eleven scientific papers, two of which are from Prof. Herdman's pen, while Mr. James Johnstone is responsible for five and Mr. Andrew Scott for four, one of which he contributes jointly with Mr. Thomas Baxter. The papers are upon the same lines of work as have been carried on in previous years, but the one upon mussel transplantation, by Messrs. Scott and Baxter, describes for the first time an experi-

<sup>1</sup> No. xiv. Report for 1905 on the Lancashire Sea Fisheries Laboratory at the University of Liverpool and the Sea Fish Hatchery at Piel. Drawn up by Prof. W. A. Herdman, F.R.S., Hon. Director of the Scientific Work, assisted by Mr. Andrew Scott and Mr. James Johnstone. Illustrated. (Liverpool, 1906.)

ment commenced some years ago, which has given interesting results. The removal of mussels from overcrowded beds and the laying down of new grounds and the restocking of old ones has proved eminently successful, and the increased rate of growth of transplanted individuals is very marked.

From the report on the sea-fish hatching at Piel we learn that more than a million plaice larvae and nearly twelve million flounder larvae were liberated during the breeding season, and a similar report upon the sea-fish hatching at Port Erin shows that five million plaice larvae were liberated off the Isle of Man, but we look in vain for any word which will show us that the liberation of these fry during several years has produced any effect upon the fisheries of the district.

An interesting paper upon trawling observations, by Mr. James Johnstone, contains a section upon the food of plaice, dabs, and other fishes, and we gather that the results so far obtained tend to show that the plaice and the dab are not competitors for food, although living upon the same ground; that whereas the former feed chiefly upon molluscs, the latter prefer Ophiurids and Crustacea, although they are less particular as to the nature of their food than are the plaice. Mr. Todd's observations as to the food of these species in the North Sea seem to bear out the omnivorous tendency of the dab, but they also seem to show that the chief food of both species in that region consists of molluscs.

Mr. Johnstone also contributes a paper on the marked fish experiments, in which he sets out the migrations of the plaice in the district, as shown by the re-capture of marked specimens. He finds that the fish tend to move along the shore lines during the winter months, and to migrate off-shore during the summer months, which facts appear to agree with the results so far determined as to the migrations of this species in the North Sea.

Mr. Andrew Scott's report on the tow-nettings for the year contains a large amount of material, but the author has not drawn conclusions therefrom, so that the paper is somewhat heavy reading.

Prof. Herdman's paper upon the oligodynamic action of copper, dealing with the possibilities of purifying infected shell-fish by immersion in distilled water which has been in contact with copper-foil, is extremely interesting, but is in the nature of a preliminary statement, as he is about to investigate the whole question in conjunction with Prof. B. Moore.

The volume is illustrated, including a useful series of plates of copepods, trematodes, &c., in connection with Mr. Andrew Scott's "Faunistic Notes."

FRANK BALFOUR BROWNE.

#### PHYSIOLOGICAL EFFECTS OF MENTAL ACTIONS.

THE most recent number of the *Beiträge zur Psychologie und Philosophie* (Band i., Heft 4) contains two articles, one by the editor, Prof. Martius, on the theory of the influence exerted on pulse and respiration by mental stimuli, while the other, by Mr. C. Minnemann, discusses pulse and respiration as studied in the subjects of genuine, first-hand emotion. Prof. Martius starts with pointing out the contradictory opinions held by other investigators regarding the effect of attention, of joyful or painful emotions on pulse and respiration. This diversity he regards as partly due to the neglect of several precautions, and he proceeds to study, amongst other points, those fluctuations of the pulse which are in direct correspondence with respiration periods. He then examines the plethysmographic method, and comes to the conclusion that variations of volume registered by it are partly due to movements of the limb under investigation, and that the method cannot be used at present to secure any definite results regarding the circulation of the blood.

Elaborate details and analyses are next given of his experiments on five human subjects; they are classed thus:—(1) effects on the pulse of artificial alterations in respiration (e.g. deepening, acceleration, retardation of breathing); (2) effects of bodily activity on pulse and respiration; (3) effects of mental activity; (4) effects of

bodily pain; (5) effects of taste and smell (whether pleasant or unpleasant); (6) effects of moods (of joy and depression) artificially induced, e.g. by hearing witty stories, recalling the contents of certain poems, or the like.

With regard to many points Prof. Martius thinks that definite conclusions are at present impossible; all that he regards as established is the presence of a series of types of general emotional or "affective" states, and especially the distinction of the two types of activity and rest. But the methods described are insufficient to characterise definitely for us special emotions like those of fear or sympathy. It seems established, too, that joy and sorrow do not possess definite complexes of symptoms by which they can be separated from one another, and further, bodily and mental activity produce the same appearances. Hence while the will and the intellect are not to be regarded as one, they cannot be separated, and we can never analyse the products of intellect merely into sensations and feelings. The other article follows the same lines and reaches a similarly safe conclusion, that we can read out of the experiment curves nothing but the most general characteristics of emotional states, viz. excitement or repression.

#### DISCOVERY OF SEVEN THOUSAND ROMAN COINS.

A COARSE earthenware jar containing upwards of seven thousand "third brass" Roman coins was recently unearthed by the ploughshare on the farm of Mrs. Wheatley, Stanley, near Wakefield. In very early times the bed of the river Calder, which has a remarkable sweep at this point, was deepened by the ancient Britons or Romans, and an embankment made with the sand; in this the jar, with its contents, was deposited 1500 years ago.

The coins all belong to the Constantinian group; to Constantine the Great, to his mother Helena, his step-mother Theodora, his four sons, Crispus, Constantine, Constantius, and Constans, Licinius his brother-in-law, with his wife Constantina and their son Licinius, and to Delmatius. The reverses are chiefly of the "Gloria Exercitus" type.

One-half, of nearly five thousand coins, which I have carefully examined is, in about equal quantities, of the "Urbs Roma" type, with wolf and twins on the reverse, and "Constantinopolis," with a Victory on the reverse with spear and shield, standing on the prow of a vessel; these latter were struck to commemorate the founding of Constantinople A.D. 330. There are twelve represented of the twenty-four mints of issue known to us, among which are Carthage, Alexandria, Antioch, Rome; but most are from Treves in Germany, the residence of the governor of the west, Lyons, and Constantina, now Arles in France.

Very few of them, if any, have ever been in circulation. They are most likely a portion of a military chest concealed during a threatened raid or invasion. It is remarkable that ten or twelve years ago a find of seventeen thousand was made in the Forest of Dean, covering the same period, of exactly the same types, with a similar redundancy of certain coins and a scarcity of others. A series of the Stanley coins has been presented to the museum of the Leeds Philosophical and Literary Society, and are now on exhibition.

AQUILA DODGSON.

#### UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

OXFORD.—The date of the fellowship examination in chemistry at Merton College has been altered from September 25 to September 18. Candidates are asked to send their names to the Warden on or before September 1, and to call on him on September 17, by which date they should submit to him any dissertations or papers, or evidence of research they have done.

During the vacancy of the Linacre chair of comparative anatomy, Mr. Edwin S. Goodrich, fellow of Merton College, has been appointed to act as deputy-professor.

New College has resolved to raise the college contribution to the stipend of the Wykeham professor of physics to 650*l.* a year, thereby increasing the total income of the professorship to 800*l.* a year.